Hytera

Owner's Manual

Battery Optimizing System

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Preface

Thanks for your favor in our product. To derive optimum performance from the product, please read this manual carefully before use.
This manual is applicable to the following model:
MCA05 series

Instructional Icons

The following icons are available through this manual:

Caution: indicates situations that could cause damage to your product.

Note: indicates tips that can help you make better use of your product.

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Instructions

To help you ward off bodily injury and property loss resulting from improper operation, please read the following safety information carefully before use.

- Do not disassemble the product during operation, to avoid fire or electric shock.
- Do not use unauthorized accessories, to avoid fire, electric shock or bodily injury.
- Do remove the AC power cord from the socket by the plug rather than the cable, to avoid fire, electric shock or bodily injury.
- Do not use the product when any part of it is damaged.
- Keep the product far away from intense shock.
- Do not expose the product to rain or moisture to avoid fire and electric shock.
- Do not operate the product in an environment which is too hot or too damp. Keep the product away from direct sunlight or other heating sources.
- Do not use chemical preparations such as stain remover, alcohol, sprays and oil preparations to clean the product; otherwise, damage may occur on its surface.
- Prior to cleaning or inspecting the product, always disconnect the power to avoid fire and electric shock.
- Do disconnect the adapter to avoid fire or electric shock.
- This product shall be serviced by qualified technicians only.

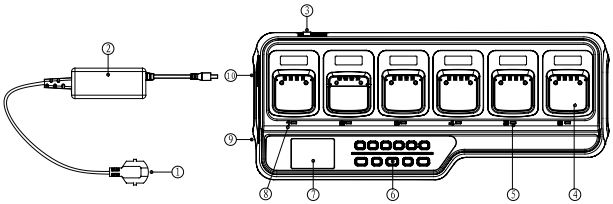
Checking Items in the Package

Please unpack carefully and check that all items listed below are received. If any item is missing or damaged, please contact us or your dealer.

No.	Name	Qty.
1	Power Adapter	1
2	AC Power Cord	1
3	Battery Optimizing System	1
4	Owner's Manual	1

Product Overview

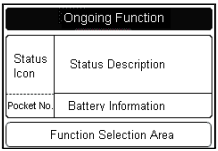
Product Controls



No.	Part Name	No.	Part Name	No.	Part Name
1	AC Plug	2	Power Adapter	3	Power Switch
4	Adapter	5	LED Indicator	6	Keys
7	LCD	8	Adapter Number	9	USB Port
10	DC Outlet				

LCD Icon

The information to be displayed on LCD and the LCD layout are shown as below.



LED Indicator

The LED indicator will help you easily identify current status of the product.

Status	LED Indicator
Standby (unloaded)	The LED flashes red slowly (0.2S ON/3S OFF)
Charging	The LED glows red.
85% or more charged	The LED glows orange.
Fully charged	The LED glows green.
Discharging	The LED flashes green rapidly (0.2S ON/0.2S OFF)
Emergency	The LED flashes red rapidly (0.2S ON/0.2S OFF)
Sleeping	The LED flashes green slowly (0.2S ON/3S OFF)

Keys

Key	Function
1~6	To access the corresponding adapter information
◀	To move the cursor leftwards
▶	To move the cursor rightwards
OK	To confirm the current operation
CANCEL	Return to system function status
SETUP	● To access the language settings ● To access the study program (reserved)

Installation

Quick Installation

1. Connecting the power supply.
   Plug the power adapter into the product, and the AC plug to the power source. See Figure 1 below.

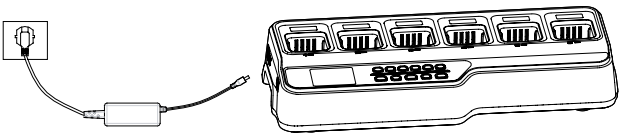


Figure 1

2. Inserting the battery.
   Place the radio with the battery attached or the battery alone into the adapter. See Figure 2 below. And the LCD will show the battery status.

Caution: Do turn off the radio before inserting it to the adapter.

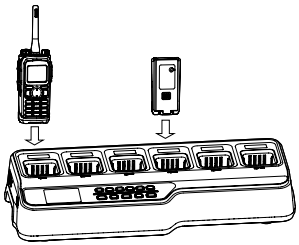


Figure 2

Replacing the adapter

This product can work with multiple kinds of batteries by replacing the adapter. For more details, please consult your dealer.

Procedures:

1. Loosen the screws, and then remove the existing adapter;
2. Align the new adapter with the product, and then tighten the screws. See Figure 3 below.

Caution:

- Do disconnect the power before replacing the adapter.
- Only the qualified technicians are allowed to replace the adapter.

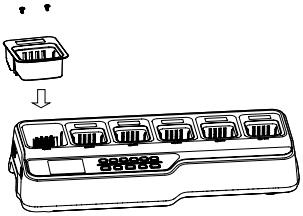


Figure 3

Basic Operations

Securing the Product

Before using the product, you shall secure it in a right position with screws (M3.5 * 10). The screw hole and the distance between two holes are shown in Figure 4.

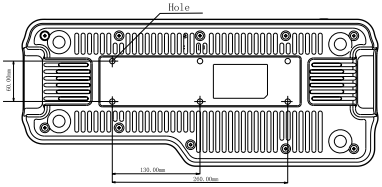


Figure 4

Turning the Product On/Off

1. Turn the power on by pressing the **Power Switch** on the rear panel, and a power-up screen will appear. See Figure 5.

Figure 5

2. You will be brought to the **System Function Status** screen by default. See Figure 6.

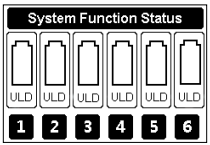


Figure 6

3. Turn the power off by pressing the **Power Switch** again.

Viewing the Version

Hold down **SETUP** and **CANCEL** simultaneously for three seconds to view the version. See Figure 7.

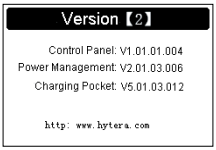


Figure 7

Setting the Language

1. Press **SETUP** to access **System Settings**. See Figure 8.

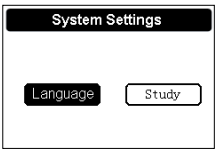


Figure 8

2. Select **Language** and press **OK** to go to language selection screen. And then use ◀ or ▶ to select your desired language, and press **OK** . See Figure 9

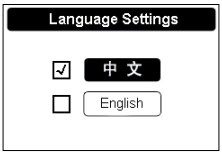


Figure 9

Functions

All functions are listed as below for your reference.

Note:
As estimated time to complete (ETC) is subject to battery capacity, battery type, current battery status, and environment temperature, the result is for your reference only. Please note that the default charging current is 1,000mA, and the default discharging current is 800mA.

Function Name	Function Description	ETC
CHG (charge)	It allows you to charge the battery.	ETC = battery capacity (mAh)/1,000mA *1.2
RECD (recondition)	It allows you to restore the capacity of battery in the following states: ●idle for over three months ● Unreasonably short operating time The result is subject to current battery type and status. It is better to enable this feature after the battery is almost exhausted.	ETC= 17h+(battery capacity(mAh) / 800mA+battery capacity(mAh) /1,000mA *1.2)*2
CAPT (capacity test)	It allows you to detect the battery capacity, thus helping you determine whether to continue to use the battery. This result is subject to the defined charging current and discharging current.	ETC = battery capacity(mAh) / 800mA + battery capacity(mAh) /1,000mA*1.2

LCT (life cycle test)	It allows you to assess the battery life cycle and capacity. **Caution** The battery shall be discarded after this test.	
SDIS (simulation discharge)	It allows you to perform a simulative discharge for the battery on 5-5-90, 10-10-80 or 5-35-60 duty cycle, to check its operating time.	T = C / ((I1 * T1 + I2 * T2+ I3 * T3)/ 60) T: duration; C: battery capacity I1: TX current T1: TX duration (6s for 10-10-80) I2: RX current T2: RX duration (6s for 10-10-80) I3: current in standby mode T3: standby duration (48s for 10-10-80)

Charge

You will access this mode by default after power-on. In any other mode, you can use ◀ or ▶ to select CHG, and then press OK to jump to this mode. See Figure 10.

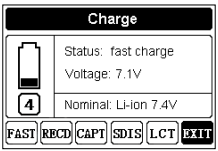


Figure 10 Charge

To return to **System Function Status** screen, press **CANCEL** directly, or use ◀ or ▶ to select **EXIT** and then press **OK**.

The charge process is shown below:

- Li-Ion Battery: recondition -> precharge -> fast charge -> constant-v charge -> completed
- Ni-MH Battery: recondition -> precharge -> fast charge -> completed

Recondition

The product will directly access this mode, if the adapter just supports one type of Li-Ion battery or Ni-MH battery. Otherwise, it is required to select the correct capacity of the battery first.

1. Use ◀ or ▶ to select **RECD**, and then press **OK** to enter the **Battery Capacity** screen. See Figure 11.

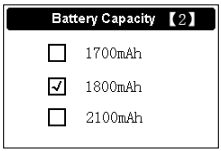


Figure 11 Battery Capacity

Caution: The selected capacity must be identical with the nominal value.

2. Use ◀ or ▶ to select the correct capacity, and then press OK to perform recondition. See Figure 11.

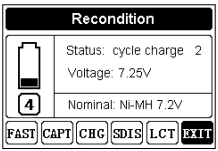


Figure 12 Recondition

To return to System Function Status screen，press CANCEL directly, or use ◀ or ▶ to select EXIT and then press OK.

The recondition process is shown below:

Trickle charge -> sleeping -> discharge -> sleeping (cycle charge N -> sleeping -> cycle discharge N -> sleeping) -> boost charge -> capacity

Note: Whether the product will perform the operations in bracket is subject to the actual battery condition. Here, N indicates the cycle time (≤2).

Capacity Test

Use ◀ or ▶ to select CAPT, and then press OK to access this mode. See Figure 13.

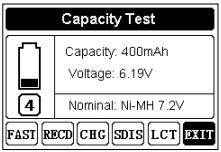


Figure 13 Capacity Test

To return to **System Function Status** screen, press **CANCE**L directly, or use ◀ or ▶ to select **EXIT** and then press **OK**.

The capacity test process is shown below:

Discharge -> sleeping -> charge -> sleeping -> discharge -> sleeping -> boost charge -> capacity

Life Cycle Test

The product will directly access this mode, if the adapter just supports one type of Li-Ion battery or Ni-MH battery. Otherwise, it is required to select the correct capacity of the battery first.

1. Use ◀ or ▶ to select **LCT**, and then press **OK** to enter the **Battery Capacity** screen. See Figure 11 above.

Caution: The selected capacity must be identical with the nominal value.

2. Use ◀ or ▶ to select the correct capacity, and then press OK to perform life cycle test. See Figure 14.

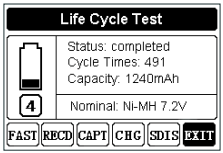


Figure 14 Life Cycle Test

To return to **System Function Status** screen，press **CANCE**L directly, or use ◀ or ▶ to select **EXIT** and then press **OK**.

The life cycle test process is shown below:

(Charge -> sleeping -> discharge ->sleeping) -> completed

Note: The product automatically performs the operations in bracket. This is an accelerated life test, and the battery shall be discarded after the test.

Simulation Discharge

The product will directly access this mode, if the battery is only applicable to one radio model. Otherwise, it is required to select the correct radio model first.

1. Use ◀ or ▶ to select **SDIS**, and then press **OK** to enter the **Model** screen. See Figure 15.

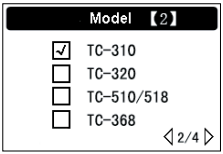


Figure 15 Model Selection

Caution: The selected radio model must match the battery. Otherwise, data error may occur

2. Use ◀ or ▶ to select the correct model, and then press **OK** to enter the **Mode** screen. See Figure 16.

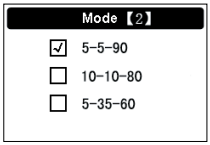


Figure 16 Mode Selection

3. Use ◀ or ▶ to select the mode, and then press **OK** to enter the Current Settings screen. Press SETUP to switch the digit and ◀ or ▶ to increase or decrease it.

   The default current is the test result, which is on grounds of high TX power, rated audio level and non-save mode. If the “others” option is selected on the Model screen, no default current value is available. In this case, you need to customize it according to your actual conditions.

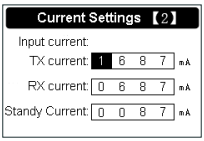


Figure 17 Current Settings

4. Press **OK** to perform simulation discharge. See Figure 18.

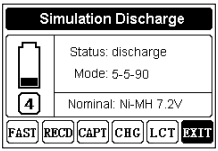


Figure 18 Simulation Discharge

To return to System Function Status screen, press CANCEL directly, or use ◀ or ▶ to select EXIT and then press OK.

Hold down the adapter number for 3 seconds to view the details. See the following figure.

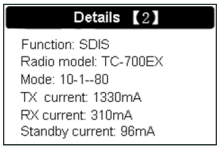


Figure 19 Details

The simulation discharge process is shown below:

Charge -> sleeping -> discharge -> sleeping -> boost charge -> completed

Function Resume

Function Resume screen will pop up in case of the following conditions, asking you whether to resume a function. See Figure 20:

- Take out the battery and re-insert it into the adapter during an in-progress service;
- Restart the product during an in-progress service.
  Afterwards, a beep sound is given to alert you to make a selection. If you do not make any operation within 15 seconds, the product will continue to perform the interrupted service by default.

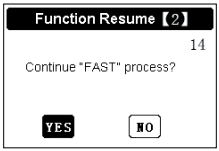


Figure 20 Function Resume

Troubleshooting

If the battery or the product fails during operation, the LCD will display an error message. See Figure 21. The error ID can help you identify and fix the problem.

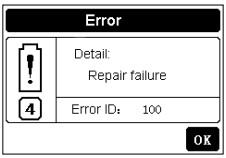


Figure 21 Error

Type	Error ID	Phenomena	Cause	Solution
Battery	100	Recondition failure	The battery is excessively discharged.	Re-insert the battery into the adapter several times.
			The battery is damaged.	Replace the battery.
	101	Precharge failure	The battery is excessively discharged.	Re-insert the battery into the adapter several times.
			The battery is damaged.	Replace the battery.
	102	High battery temperature	The ambient temperature is high during charge.	Charge the battery in the place with a low temperature.
			The radio is inserted into the adapter immediately after a call ends.	Cool down the battery before putting radio into the adapter.
			The battery is damaged.	Replace the battery.
	103	Battery failure	There is no voltage during charging.	Replace the battery.
			There is no voltage during discharging.	
			The charging piece (positive) is in bad contact during discharging.	Repair the charging piece (positive)
	104	High battery temperature	The ambient temperature is too high during trickle charge.	Recondition the battery in the place with a low temperature.
			The radio is inserted into the adapter immediately after a call ends.	Cool down the battery before putting radio into the adapter.
			The battery is damaged.	Replace the battery.

Type	Error ID	Phenomena	Cause	Solution
Battery	105	High battery temperature	The ambient temperature is too high during discharge.	Discharge the battery in the place with a low temperature.
			The radio is inserted into the adapter immediately after a call ends.	Cool down the battery before putting radio into the adapter.
			The battery is damaged.	Replace the battery.
	106	Charge timeout	The Li-Ion battery is not charged by constant voltage after 6-hour charging.	Check whether the battery is the original one.
			The battery is damaged.	Replace the battery.
	107	Charge timeout	The Li-Ion battery is not charged by constant voltage after 10-hour charging.	Check whether the battery is the original one.
			The battery is damaged.	Replace the battery.
	108	Charge timeout	The charge duration of Ni-MH battery is more than four hours, but the voltage is low.	Check whether the battery is the original one.
			The battery is damaged.	Replace the battery.
	109	Charge timeout	The charge duration of Ni-MH battery is more than seven hours, but the voltage is low.	Check whether the battery is the original one.
			The battery is damaged.	Replace the battery.

Type	Error ID	Phenomena	Cause	Solution
Battery analyzer	200	Communication failure	PCB1, PCB2 or MCU is damaged.	Replace the whole PCB
			The FFC gets loose.	Replace the FFC or re-put it.
	202	Fan failure	The fan of #3 adapter is blocked by foreign objects.	Remove the foreign object
	203	Fan failure	The fan of #4 adapter is blocked by foreign objects.	
	204	Adapter failure	The adapter is not installed.	Install the adapter.
	205	Overcurrent protection	PCB1 or PCB2 does not work properly.	Replace the PCB.
	206	The voltage of power supply is too high.	The power adapter does not work properly.	Replace the power adapter.
	207	The voltage of the power supply is too low.		
	208	Adapter failure	Reading fails.	Try it again or replace the adapter.
	209	Capacity self-test failure.	PCB1 or PCB2 does not work properly.	Replace the PCB.

Care and Cleaning

To guarantee optimal performance as well as a long service life of the product, please follow the tips below.

Product Care

- Keep the product at a place of good ventilation and heat dissipation to facilitate normal work.

- Do not place irrelevant articles on top of the product to ensure optimal heat dissipation.
- Do not place the product in corrosive agents, solutions or water.

Product Cleaning

- Clean up the dust and fine particles on the product parts with a clean and dry lint-free cloth or a brush regularly.
- Use a non-woven cloth with neutral cleanser to clean the keys and housing after long-time use. Do not use chemical preparations such as stain removers, alcohol, sprays or oil preparations. Make sure the product is completely dry before use.

Caution: Do disconnect the power supply before cleaning.

Optional Accessories

The following items are the main optional accessories for the product, and please consult your local dealer for more information.

POA38 (for PD78X, TC-720S and PT580H series) POA41 (for TC-700, TC-780 and TC-790 series) POA40 (TC-890GM series)	 **Note:**Different adapters apply to different batteries or radios. See the orange label.

Caution: Use the accessories specified by the Company only. If not, the Company shall not be liable for any losses or damages arising out of use of unauthorized accessories.